

AD-A034 545

NAVY EXPERIMENTAL DIVING UNIT PANAMA CITY FLA

F/0 14/2

EVALUATION OF THE PRINCETON TECTONICS BOTTOM TIMER STOP WATCH. (U)

JUN 76 D J SCHMITT

UNCLASSIFIED

NEDU-7-76

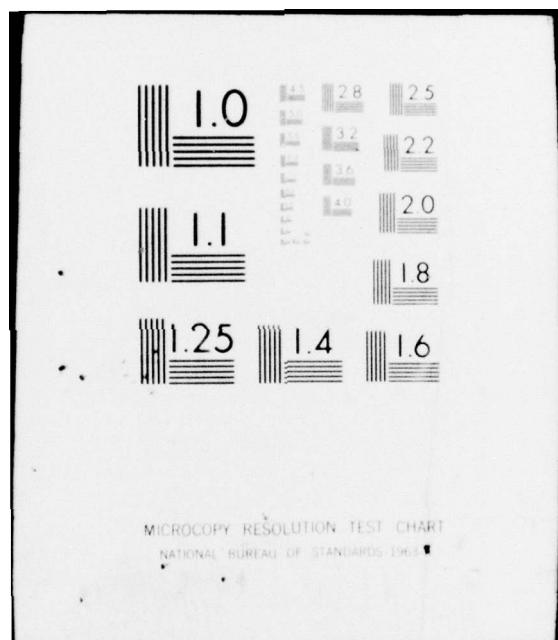
NL

1 OF 1  
AD  
A034545



END

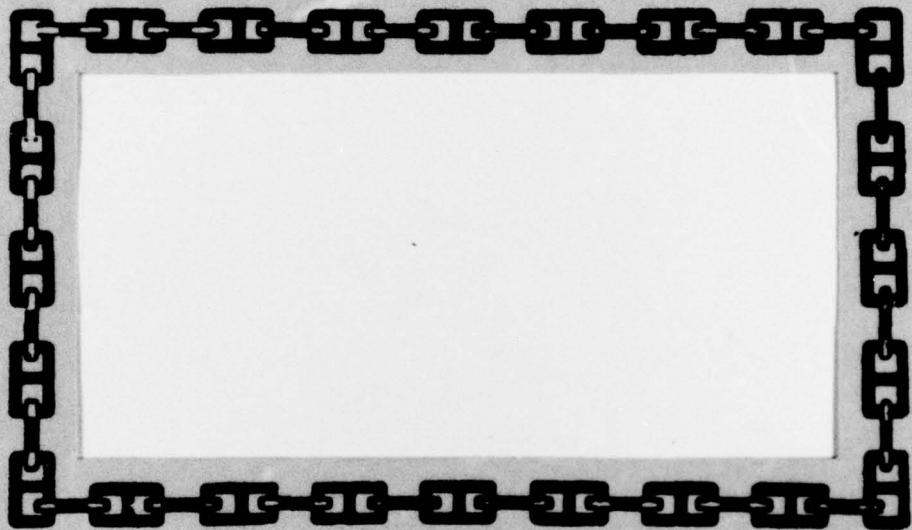
DATE  
FILMED  
2-77



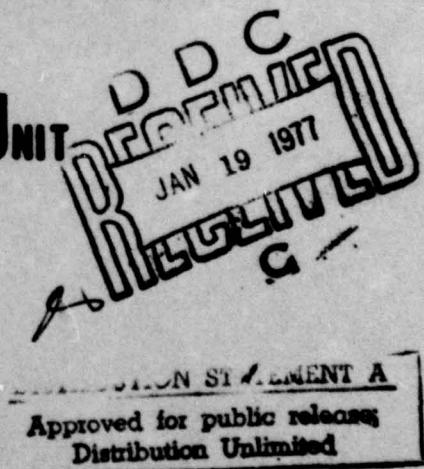
ADA034545



12  
NW



## NAVY EXPERIMENTAL DIVING UNIT



COPY AVAILABLE TO DDC DOES NOT  
PERMIT FULLY LEGIBLE PRODUCTION

DEPARTMENT OF THE NAVY  
NAVY EXPERIMENTAL DIVING UNIT  
Panama City, Florida 32401

NAVY EXPERIMENTAL DIVING UNIT  
REPORT 7-76

9 EVALUATION OF THE PRINCETON TECTONICS  
BOTTOM TIMER STOP WATCH.

10 D. J. SCHMITT

11 Jun 1976

12 8P.

9 Final rept.

14 NEDU-7-76

DDC  
Approved  
IN 19 1977  
Released  
C.

Approved for public release; distribution unlimited

Submitted:

D. J. Schmitt  
D. J. SCHMITT  
T & E Dept.

Reviewed:

J. G. Malec  
LCDR, RN  
T & E Dept. Head

Approved:

J. Michael Ringelberg  
CDR, USN  
Commanding Officer

1473  
253650  
LB

## ABSTRACT

The Princeton Tectonics bottom timer stop watch was tested by the Navy Experimental Diving Unit in June 1976.

Performance of the unit was as claimed by the manufacturer with automatic starting, timing, and stopping. After test, the bottom timer stop watch is recommended for Navy approval but not for inclusion on NAVSEA Instruction 9597.1 of 1 March 1976.

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT . . . . .	ii
INTRODUCTION . . . . .	1
TEST EQUIPMENT . . . . .	1
TEST PROCEDURE . . . . .	1
RESULTS . . . . .	1
MAN-HOURS REQUIRED FOR TEST . . . . .	2
CONCLUSIONS AND RECOMMENDATIONS . . . . .	2

ACCESSION TO	
NTAS	White Section
DOC	Buff Section <input type="checkbox"/>
UNANNOUCED <input type="checkbox"/>	
JUSTIFICATION .....	
BY .....	
DISTRIBUTION/AVAILABILITY CODES	
Dist.	AVAIL. REG/IR SPECIAL
A	

**UNCLASSIFIED**

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

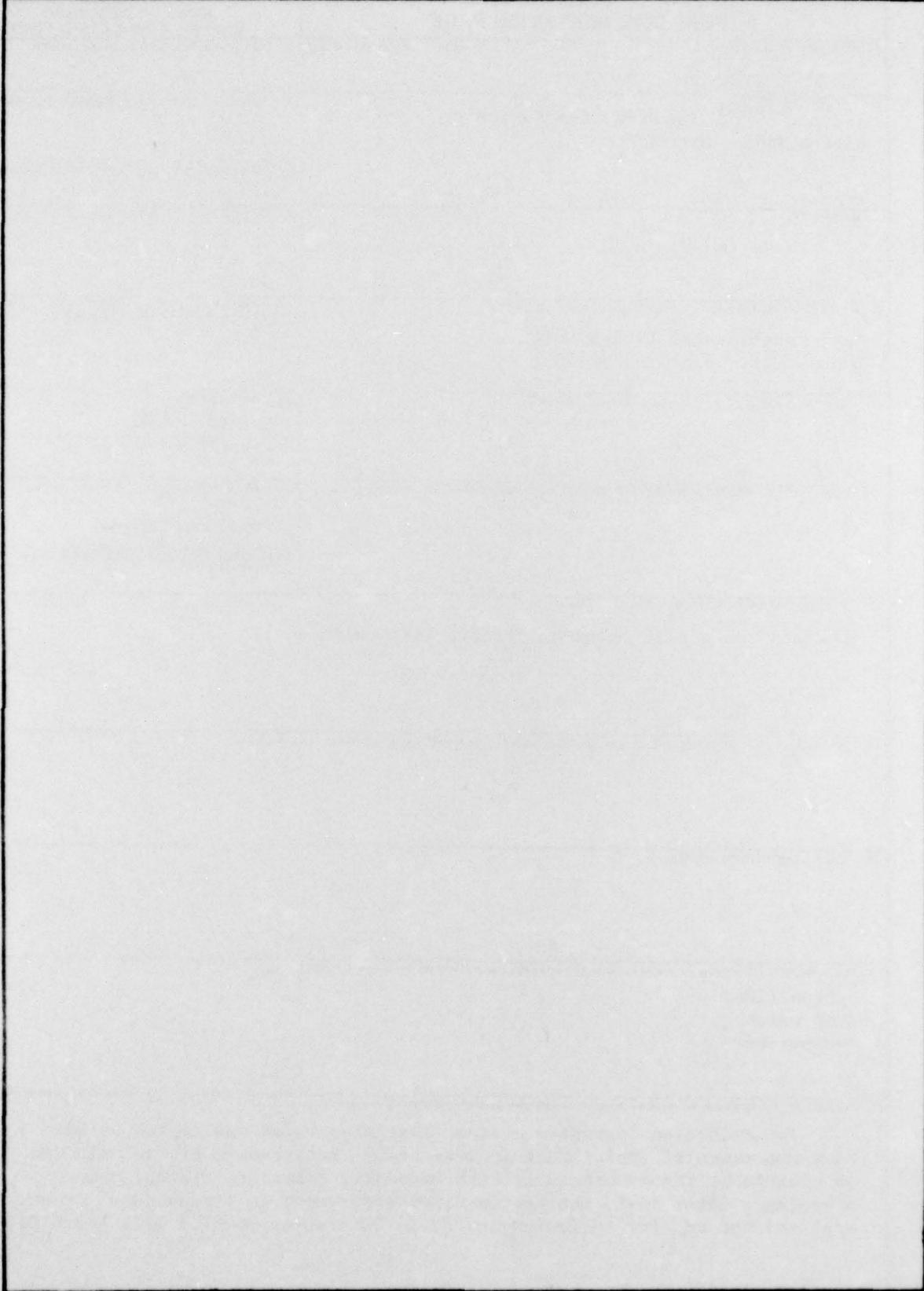
REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NEDU REPORT NO. 7-76	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Evaluation of the Princeton Tectonics Bottom Timer Stop Watch		5. TYPE OF REPORT & PERIOD COVERED Final
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) D. J. Schmitt		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Navy Experimental Diving Unit Panama City, Florida 32401		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE June 1976
		13. NUMBER OF PAGES 3
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Bottom timer Stop watch Evaluation		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Princeton Tectonics bottom timer stop watch was tested by the Navy Experimental Diving Unit in June 1976. Performance of the unit was as claimed by the manufacturer with automatic starting, timing, and stopping. After test, the bottom timer stop watch is recommended for Navy approval but not for inclusion on NAVSEA Instruction 9597.1 of 1 March 1976.		

DD FORM 1473  
1 JAN 73EDITION OF 1 NOV 68 IS OBSOLETE  
S/N 0102-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

## INTRODUCTION

The Princeton Tectonics bottom timer stop watch is designed with a pressure-sensitive diaphragm built into the back of its plastic housing. As the diver descends, pressure on the diaphragm releases an internal spring to start the watch. The bottom timer is calibrated to start at approximately 7 feet of sea water (fsw). The timer runs continuously during the dive until the diver returns to 7 feet. Although the timer starts and stops automatically, it must be wound and set manually. It can be reset by the diver below the surface of the water.

Two of these units were submitted to the Navy Experimental Diving Unit for test and evaluation in June 1976.

## TEST EQUIPMENT

A Bethlehem chamber, model 183.610HP, and test gauge 25546-25011-GAG, calibrated 18 June 1976, were required to test the Princeton Tectonics bottom timer stop watches.

## TEST PROCEDURE

The bottom timer stop watches were placed in a container and immersed in 8 inches of fresh water. The container was placed in the Bethlehem chamber which was then pressurized with high-pressure air to 8 fsw. At that time, the timer started and the test operator started his stop watch. By looking through the chamber window, readings were obtained and then recorded for the various test depths.

## RESULTS

Recordings made at the depths tested are given in Table 1. The timers started at 8 fsw and stopped when pressure was returned to 5 fsw.

#### MAN-HOURS REQUIRED FOR TEST

Man-hours required to complete the test procedure were as follows:

	<u>Man-hours</u>
Chamber operation, 3 men, 2 hours	6
Reporting manuscript, 1 man, 3 hours	3
Duplicating, 1 man, 1 hour	<u>1</u>
TOTAL	10 Man-hours

#### CONCLUSIONS AND RECOMMENDATIONS

The Princeton Tectonics bottom timer stop watch started and stopped as stated in the manufacturer's operating instructions. Its use by the Navy at this time would be minimal; therefore, it is recommended that this unit be approved by the Navy but not placed on NAVSEA Instruction 9597.1 of 1 March 1976. It is possible, however, that, at some future time, its use would be required.

TABLE 1

TIMER READINGS DURING  
BOTTOM TIMER TEST

Depth (ft)	Elapsed Time (mins)	Timer #1	Timer #2
10	5	5::03	5::04
20	10	10::07	10::05
50	15	15::07	15::10
75	20	20::10	20::07
100	25	25::15	25::10
125	30	30::18	30::12
150	35	35::20	35::13
200	40	40::22	40::15
225	45	45::25	45::17
250	50	50::29	50::17
275	55	55::34	55::21
300	60	60::37	60::23

